

## **REMARKS**

An extension of one month to respond to the Office Action is requested, so that the due date for response will be April 30, 2004. A check for the large entity extension fee of \$110 is enclosed.

Reconsideration of this application and allowance of the claims is respectfully requested. The amendments to claims 1 and 19 are clearly supported by Example 8, in which the phosphorous-sulfur compound is thermally treated in a tube-in-tube heat exchanger. Then, the thermally treated compound proceeds to an injector, where the thermally treated compound contacts the feed in a pyrolysis furnace coil and is dispersed in the feed, to contract the heat transfer surfaces. Similarly, the heat treatment in Example 9 takes place prior to discharge into the feed into the pyrolysis furnace coil.

The examiner has rejected claims 1-26 as unpatentable over Kaplan et al. U.S. Patent No. 4,842,716, in view of Stein U.S. Patent No. 5,632,865.

As the examiner states, Kaplan et al. discloses a method for reducing fouling and corrosion of ethylene cracking surfaces using petroleum feedstocks. The antifoulant compound comprises a phosphorus-sulfur compound, "...mixed with a filming amount of at least 2-20 ppm imidazoline filming inhibitor..." (see the Abstract).

At page 3 of the Office Action, second paragraph, the examiner acknowledges that Kaplan et al. "does not disclose heating a phosphorus-sulfur compound . . . to yield a heat-treated phosphorus sulfur compound..." (of specified characteristics). This is then followed by "...contacting the heat transfer surfaces with the heat-treated phosphorus-sulfur compound" (quoting claim 1).

However, the examiner argues that the Stein reference would render this heat treatment step obvious, when combined with Kaplan et al.

Stein et al. teaches a method of introducing an aggressive liquid additive into a vapor-containing process stream. This is done by vaporizing the liquid additive to minimize the presence of liquid portions. For example, as described by Stein et al. at column 2, lines 14-17 "... Optionally, an inert gas substantially free of aggressive liquid additive and the vaporized form of the aggressive liquid additive is injected downstream of the injection quill and into the vapor-containing process stream. As a result, the inert gas substantially prevents condensation of the vaporized form of the aggressive liquid additive downstream of the injection quill."

By this means, Stein allegedly reduces corrosion caused by the liquid form of the aggressive liquid additives. See further in Stein et al. column 3, lines 16-18: "The location at which the liquid additive vaporizes is not critical so long as it is in vapor form before or upon entering the vapor-containing process stream."

From this disclosure, and from more which is found therein, those skilled in the art would conclude that the process of Stein et al. is a process of putting the aggressive liquid additive into vapor form, so that there is little or no liquid additive entering the process stream to cause corrosion problems.

However, when one skilled in the art views the technique of Kaplan et al., it is clear that the phosphorus-sulfur antifoulant compound used therein is not used in the vapor form! Rather, the antifoulant compound is clearly taught as being "...mixed with a filming amount of at least 2-20 ppm imidazoline filming inhibitor..." (see last lines of the Abstract). As further taught by Kaplan et al. at column 4, lines 2-5: "A simple approach

to minimize the corrosivity problem was to formulate the phosphorus based antifoulants with a non-volatile filming corrosion inhibitor.”

Note the word “non-volatile”. This is by no means a vapor process, but, rather, the phosphorus-sulfur compounds are incorporated into a non-volatile, liquid film that is carried on the surface being protected.

Accordingly, those skilled in the art having Kaplan et al. before them, and considering Stein et al., would simply not be lead to make the combination that the examiner suggests. The purpose of Stein et al. is to vaporize an aggressive liquid additive. It is entirely contrary to the teachings of Stein to place a liquid additive into a non-volatile film as is done in Kaplan et al.


Accordingly, Kaplan et al. strongly leads away from any thought of the use of the process of Stein et al. The purpose of the preheating in Stein is to create a vapor. This is entirely contrary to the purpose of Kaplan et al., and vaporized antifoulant compound would not be useable in the Kaplan et al. invention, while Stein et al. strongly teaches away from the use of a liquid antifoulant compound. The very purpose of Stein et al. is to convert liquid present into vapor, while that flies in the face of, and contradicts, the Kaplan et al. technique of using a non-volatile film of corrosion inhibitor, and to formulate the phosphorus-based antifoulants into such a film (Kaplan et al. column 4, lines 2-5).

In view of the above, it is submitted that the combination of references raised by the examiner simply does not teach the preheating step that has the unexpected advantage alleged in this application of improved antifouling activity.

In view of the above, allowance of the claims is respectfully requested.

Respectfully submitted,

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4/30/04

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